

VAX/VMS DECnet Test Sender/DECnet Test Receiver Utility Reference Manual

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VAX/VMS DECnet Test Sender /DECnet Test Receiver Utility Reference Manual

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This document provides information for VAX/VMS users who wish to test network task-to-task operations. The DTS/DTR Utility consists of four types of network software tests: a connection test, a disconnection test, a data test, and an interrupt test.

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Preface

This reference manual presents the commands that make up the DECnet Test Sender/DECnet Test Receiver (DTS/DTR) Utility.

Intended Audience

The *VAX/VMS DECnet Test Sender/DECnet Test Receiver Utility Reference Manual* is intended for use as a reference to the formats and syntax of the DTS commands by those already familiar with DECnet-VAX. System managers can use DTS to run connection, disconnection, data, and interrupt tests to check the software involved in task-to-task communication over the network.

Structure of This Document

This document is composed of three major sections.

The Format Section is an overview of DTS and is intended as a quick reference guide. The format summary contains the DCL command that invokes DTS. The usage summary describes how to invoke and exit DTS, how to direct output, and any restrictions you should be aware of. The command summary lists all commands that can be used within DTS.

The Description Section explains how to use DTS.

The Command Section describes each DTS command. Commands appear in alphabetical order.

Associated Documents

Before using the DTS/DTR Utility, you should be familiar with the networking concepts presented in the *Guide to Networking on VAX/VMS*.

For information concerning VAX PSI, refer to the following manuals, which make up the VAX PSI documentation set.

- Introduction to VAX PSI*
- VAX PSI Installation Procedures*
- VAX PSI X.25 Programmer's Guide*
- VAX PSI X.29 Programmer's Guide*
- VAX PSI Management Utilities Manual*
- VAX PSI User Utilities Manual*
- VAX PSI Release Notes.*

For information on using VAX PSI in your own particular network, refer to the appropriate PSI reference card.

The following functional specifications define DIGITAL Network Architecture (DNA) protocols to which all implementations of DECnet adhere:

- DECnet DIGITAL Network Architecture General Description*
- DIGITAL Data Communications Message Protocol Functional Specification*
- Network Services Protocol Functional Specification*
- Maintenance Operation Protocol Functional Specification*
- Data Access Protocol Functional Specification*

Routing Layer Functional Specification
DNA Session Control Functional Specification
Network Management Functional Specification

Conventions Used in This Document

Convention	Meaning
CONNECT/general-qualifier	Command example verbs and keywords are shown in a command line in capital letters, and they must be entered as shown. Arguments are shown in command lines as lowercase letters. (In this case, you substitute the argument shown in the command format with the precise information requested.)
\$ TYPE MYFILE.DAT . . .	Vertical series of periods, or ellipsis, mean either that not all the data that the system would display in response to the particular command is shown or that not all the data a user would enter is shown.
file-spec,...	Horizontal ellipsis indicates that additional parameters, values, or information can be entered.
_Test: EXIT	Command examples show all output lines or prompting characters that the system prints or displays in black letters. All user-entered commands are shown in red letters.
[opt-arg]	Square brackets indicate that the enclosed item is optional.

DTS

DECnet Test Sender (DTS) and DECnet Test Receiver (DTR) are the DECnet transmitter and receiver test programs that exercise network task-to-task capabilities. DTSEND and DTRECV are the DECnet-VAX implementations of these programs. The images and command files to use DTSEND and DTRECV are included with the DECnet-VAX software.

There are four basic network tests provided by DTS and DTR:

- Connection tests
- Data tests
- Disconnection tests
- Interrupt tests

Each test is composed of a set of subtests. See the following sections for a description of each test and its subtests.

FORMAT

\$ RUN SYS\$SYSTEM:DTSEND

Command Qualifiers

None.

Defaults

None.

Command Parameters

None.

usage summary

Invoking

Be sure that the necessary line (if any) is in the ON state. To invoke DTS, type RUN SYS\$SYSTEM:DTSEND in response to the DCL prompt.

DTS returns with the following information and prompt:

DTS Version xxx initiated on dd-mmm-yy hh:mm:ss

_Test:

DTS will also accept a command procedure as input.

Exiting

To exit DTS and thereby terminate the test, enter EXIT for the _Test: prompt. For example,

_Test: EXIT

DTS terminated on dd-mmm-yy hh:mm:ss

\$

Directing Output

Use the /PRINT qualifier to print test results. Also, you can use the /STATISTICS and /DISPLAY qualifiers to print statistics and messages transmitted to the DTR, respectively. The /STATISTICS and /DISPLAY qualifiers apply only to the data and interrupt tests. See the individual commands for more information.

Privileges/Restrictions

None.

commands**Syntax**

_Test: command [/qualifier[,...]]

DTS Commands**CONNECT**

/NODENAME
=node-id
/[NO]PRINT
/SPEED
=number
/TYPE
=test-type
/RETURN
=return-option

DATA

/NODENAME
=node-id
/[NO]PRINT
/[NO]STATISTICS
/[NO]DISPLAY
/SPEED
=number
/TYPE
=test-type
/SIZE
=number
test-duration
/FLOW
=flow-control
/QUEUE
=number
/SQUEUE
=number
/[NO]NAK
=number
/[NO]BACK
=number

DISCONNECT

(same as for CONNECT)

INTERRUPT

/NODENAME
=node-id
/[NO]PRINT
/[NO]STATISTICS
/[NO]DISPLAY
/SPEED
=number

/TYPE
=test-type
/SIZE
=number
test-duration
/FLOW
=flow-control
/RQUEUE
=number
/SQUEUE
=number

DESCRIPTION This section describes the operational characteristics of DTS/DTR and command syntax for DTS.

1 Operational Characteristics

DTS and DTR are cooperating tasks that perform various functions to exercise network software. DTR functions as a slave to DTS. DTS initiates each test by issuing a connection request to DTR. DTS passes parameters pertinent to the type of test request to DTR in the optional data of the connection request. The user interface to DTS consists of a group of commands. These commands enable the user to select the type of test and subtest and to specify options relative to the operation of the test. These options include parameters to regulate the duration of the test, the type of information to be used for the test, and buffer level control.

The DTS command syntax allows for two types of buffer level options: SQUEUE and RQUEUE. SQUEUE affects the operation of DTS, whereas RQUEUE affects the operation of DTR. The SQUEUE parameter specifies the transmission buffer level for DTS. This level is the number of transmission requests that DTS will attempt to keep outstanding to the network during the data test. For an echo test, the SQUEUE parameter also specifies the DTS buffer level for receiving data. The RQUEUE parameter specifies the DTR buffer level for receiving data during the data test.

Note that the VAX/VMS DTRECV image cannot perform multiple buffering. In addition, it does not support any NAK or BACK options nor flow control other than segment. DTSEND does not support multiple buffering either.

2 DTS Command Syntax

This section describes the DTS command syntax for all tests. Each command consists of a command keyword, optional general command qualifiers, each preceded by a slash (/) character, and optional command-specific qualifiers, each preceded by a slash character. You may abbreviate command keywords and qualifiers to four characters or less (if unique).

Note that when using DTS commands in a batch job, be sure to use uppercase characters in the command.

The general DTS command syntax and the definition of each command component is shown below.

DTS

Description

Format

command-keyword/general-qualifier,.../command-specific-qualifier,...

command-keyword	Specifies the general test to be performed. CONNECT Indicates a connect test DISCONNECT Indicates a disconnect test DATA Indicates a data test INTERRUPT Indicates an interrupt test
general-qualifier	Specifies one or more general test characteristics regardless of the test to be performed. These qualifiers and their default values are described in each command (CONNECT, DATA, DISCONNECT, and INTERRUPT) where they apply.
command-specific-qualifier	Specifies one or more test-specific qualifiers that regulate the operation of the test.

The general command syntax adheres to the DCL rules for comments and continuation lines, as shown in the example below.

```
$ RUN SYS$SYSTEM:DTSEND
_TEST: DATA/PRINT/TYPE=SEQ      !Perform Data Test
.
_TEST: INTERRUPT/NODENAME=DALLAS -
      _/PRINT/TYPE=PAT          !Perform Interrupt Test
.
_TEST: EXIT
$
```

COMMANDS This section explains how to use the four DTS tests. Examples are provided for each test.

CONNECT

Invokes a connection test.

FORMAT

CONNECT *[/general-qualifier[,...] /command-specific-qualifier[,...]]*

general qualifiers

/NODENAME=node-id

Identifies the node (by name or address) on which DTR is to run. The default is the local node. DTR runs on the default nonprivileged account on the remote node because you cannot use access control information as part of the node name.

/[NO]PRINT

Instructs DTS to print (or log) test results. The default is /NOPRINT.

/SPEED=number

Indicates the line speed (bits per second) of the test line. DTS uses this qualifier for reporting statistics. (DECnet does not control line speeds.) The default is /SPEED=1000000.

Once selected, these qualifiers remain active until you explicitly change them or exit DTS.

command- specific qualifiers

/TYPE=test-type

Indicates the subtest for the connection test. There are two subtests:

ACCEPT	Indicates a connect accept test. The default is /TYPE=ACCEPT
REJECT	Indicates a connect reject test

/RETURN=return-option

Indicates the type of optional user data DTR returns. The default is /NORETURN where DTR returns no optional user data. There are two possibilities:

STANDARD	Indicates standard user data
RECEIVED	Indicates received user data

DESCRIPTION

Connection tests evaluate the ability of the network software to process connect, connect accept, and connect reject requests with and without optional user data. Connection tests that you may perform include the following:

- Connect reject without user data
- Connect accept without user data
- Connect reject with 16 bytes of standard user data
- Connect accept with 16 bytes of standard user data
- Connect reject with received user data used as reject user data
- Connect accept with received user data used as accept user data

EXAMPLES

1 **_Test:** CONNECT/TYPE=ACCEPT/RETURN=RECEIVED

This command invokes the connection test with the connect accept subtest. DTS attempts to connect to DTR on the local node (by default). Connect user data is to be returned as part of the test.

2 **_Test:** CONNECT/NODENAME=TRNTO

This command invokes the connection test with the connect accept subtest. DTS attempts to connect to DTR on remote node TRNTO. DTR returns no optional user data.

DATA

Invokes a data test.

FORMAT

DATA [/general-qualifier[,...]
/command-specific-qualifier[,...]]

general qualifiers

/NODENAME=node-id

Identifies the node (by name or address) on which DTR is to run. The default is the local node. DTR runs on the default nonprivileged account on the remote node because you cannot use access control information as part of the node name.

/[NO]PRINT

Instructs DTS to print (or log) test results. The default is /NOPRINT.

/[NO]STATISTICS

Instructs DTS to print statistics on data and interrupt tests. The default is /STATISTICS.

/[NO]DISPLAY

Instructs DTS to print the data and interrupt messages transmitted to DTR. The default is /NODISPLAY.

/SPEED=number

Indicates the line speed (bits per second) of the test line. DTS uses this qualifier for reporting statistics. (DECnet does not control line speeds.) The default is /SPEED=1000000.

Once selected, these qualifiers remain active until you explicitly change them or exit DTS.

command- specific qualifiers

/TYPE=test-type

Indicates the subtest for the data test. There are four subtests:

SINK Indicates a sink test. The default is /TYPE=SINK.
SEQ Indicates a sequence test
PAT Indicates a pattern test
ECHO Indicates an echo test

/SIZE=number

Indicates the data message length in bytes. The lower bounds are 0 for a sink or echo test; 4 for a sequence test; and 5 for a pattern test. The upper bound is 4096 bytes for all tests. The default is /SIZE=128.

/[test-duration]

Indicates the duration of the test. There are three units of time for this parameter:

/SECONDS=number

/MINUTES=number

/HOURS=number

The number specifies the duration of the test. The default unit is ***/SECONDS=30***. The maximum test duration is 3,600,000 seconds or 1000 hours.

/FLOW=flow-control

Indicates the flow control type—that is, the DTR buffering level. There are two types:

SEGMENT Indicates segment flow control

MESSAGE Indicates message flow control

With ***/NOFLOW***, DTR uses no flow control. The default is ***/FLOW=MESSAGE***.

/RQUEUE=number

Indicates the number of pending receives for DTR to maintain. The maximum number is 8. The default is ***/RQUEUE=1***.

/SQUEUE=number

Indicates the number of pending transmissions for DTS to maintain. The default is ***/SQUEUE=1***.

/[NO]NAK=number

Indicates the number of segments between NAKs. The default is ***/NONAK***.

/[NO]BACK=number

Indicates the number of segments before back pressuring. The default is ***/NOBACK***.

DESCRIPTION

Data tests provide a full spectrum of test capabilities, ranging from the very simple data sink operation through data integrity checking. Data tests that you may perform include the following:

- Sink Test. DTR ignores all data received during this test. DTR performs neither sequence nor content validation.
- Sequence Test. Data messages transmitted by DTS to DTR include a 4-byte sequence number. During the sequence test, if a message is received out of sequence, DTR aborts the logical link and the test.
- Pattern Test. Data messages transmitted to DTR have both a sequence number and a standard data pattern. During the pattern test, if either the sequence number or the received data does not match the expected data, DTR aborts the logical link and the test.

DTS DATA

- Echo Test. DTR transmits all data messages received back to DTS during this test. Neither DTS nor DTR performs sequence or data validity checking.

EXAMPLE

```
_Test: DATA/PRINT/TYPE=SEQ/SIZE=128/SECONDS=10/FLOW=MESSAGE
      _DTS-S-NORMAL, normal successful completion
Test parameters:
Test duration (sec) 10
Target nodename     ""
Line speed (baud) 1000000
Message size (bytes) 128
Summary statistics:
Total messages XMIT 788      RECV  0
Total bytes XMIT 100864
Messages per second 78.8
Bytes per second 10086
Line throughput (baud) 80691
_ Line utilization 8.0
```

This command invokes the data test with the sequence subtest. DTS sends messages to DTR on the local node where test information will be printed. The message size is 128 bytes, and the duration of the test is 10 seconds. DTR uses message flow control.

DISCONNECT

Invokes a disconnection test.

FORMAT

DISCONNECT *[/general-qualifier[,...]
/command-specific-qualifier[,...]]*

general qualifiers

/NODENAME=node-id

Identifies the node (by name or address) on which DTR is to run. The default is the local node. DTR runs on the default nonprivileged account on the remote node because you cannot use access control information as part of the node name.

/[NO]PRINT

Instructs DTS to print (or log) test results. The default is /NOPRINT.

/SPEED=number

Indicates the line speed (bits per second) of the test line. DTS uses this qualifier for reporting statistics. (DECnet does not control line speeds.) The default is /SPEED=1000000.

Once selected, these qualifiers remain active until you explicitly change them or exit DTS.

command- specific qualifiers

/TYPE=test-type

Indicates the subtest for the disconnection test. There are two subtests:

SYNCHRONOUS	Indicates a synchronous disconnect test
ABORT	Indicates a disconnect abort test. The default is /TYPE=ABORT.

/[NO]RETURN=return-option

Indicates the type of optional user data DTR returns. There are two possibilities:

STANDARD	Indicates standard user data
RECEIVED	Indicates received user data

The default is /NORETURN where DTR returns no optional user data.

DESCRIPTION

Disconnection tests evaluate whether or not DTS detects the difference between disconnection and abort sequences generated by DTR as well as the ability of DTS to receive the proper optional user data. Disconnection tests that you can perform include the following:

- Disconnect without user data
- Abort without user data
- Disconnect with 16 bytes of standard user data

DTS

DISCONNECT

- Abort with 16 bytes of standard user data
- Disconnect with received connect user data used as disconnect user data
- Abort with received connect user data used as abort user data

EXAMPLE

_Test: DISCONNECT/NODENAME=DENVER/TYPE=ABORT

This command invokes the disconnection test with the disconnect abort subtest. DTS performs this test with DTR on remote node DENVER. No optional user data is to be returned.

INTERRUPT

Invokes an interrupt test.

FORMAT

INTERRUPT *//general-qualifier[,...]
/command-specific-qualifier[,...]*

general qualifiers

/NODENAME=node-id

Identifies the node (by name or address) on which DTR is to run. The default is the local node. DTR runs on the default nonprivileged account on the remote node because you cannot use access control information as part of the node name.

/[NO]PRINT

Instructs DTS to print (or log) test results. The default is /NOPRINT.

/[NO]STATISTICS

Instructs DTS to print statistics on data and interrupt tests. The default is /STATISTICS.

/[NO]DISPLAY

Instructs DTS to print the data and interrupt messages transmitted to DTR. The default is /NODISPLAY.

/SPEED=number

Indicates the line speed (bits per second) of the test line. DTS uses this qualifier for reporting statistics. (DECnet does not control line speeds.) The default is /SPEED=1000000.

Once selected, these qualifiers remain active until you explicitly change them or exit DTS.

command- specific qualifiers

/TYPE=test-type

Indicates the subtest for the interrupt test. There are four subtests:

SINK	Indicates a sink test. This is the default.
SEQ	Indicates a sequence test
PAT	Indicates a pattern test
ECHO	Indicates an echo test

/SIZE=number

Indicates the data message length in bytes. The lower bounds are 0 for a sink or echo test; 4 for a sequence test; and 5 for a pattern test. The upper bound is 16 bytes for all tests. The default is /SIZE=16.

DTS

INTERRUPT

/[test-duration]

Indicates the duration of the test. There are three units of time for this parameter:

/SECONDS=number
/MINUTES=number
/HOURS=number

The number specifies the duration of the test. The default unit is /SECONDS=30. The maximum test duration is 3,600,000 seconds or 1000 hours.

RQUEUE=number

Indicates the number of pending receives for DTR to maintain. The maximum number is 8. The default is /RQUEUE=1.

SQUEUE=number

Indicates the number of pending transmissions for DTS to maintain. The default is /SQUEUE=1.

DESCRIPTION

As with data tests, interrupt tests provide a full range of test capabilities from the very simple data sink operations through data integrity checking. Interrupt tests that you can perform include the following:

- Sink Test. DTR ignores all interrupt data received during this test. DTR performs neither sequence nor content validation.
- Sequence Test. Interrupt messages transmitted by DTS to DTR include a 4-byte sequence number. During the sequence test, if a message is received out of sequence, DTR aborts the logical link and the test.
- Pattern Test. Interrupt messages transmitted to DTR have both a sequence number and a standard data pattern. During the pattern test, if either the sequence number or the received data does not match the expected data, DTR aborts the logical link and the test.
- Echo Test. DTR transmits all interrupt messages received back to DTS during this test. Neither DTS nor DTR performs sequence or data validity checking.

EXAMPLE

```
_Test:  INTERRUPT/NODENAME=DALLAS/PRINT/TYPE=PAT/SIZE=16
       _DTS-S-NORMAL, normal successful completion

Test parameters:
Test duration (sec) 30
Target nodename    "DALLAS"
Line speed (baud) 1000000
Message size (bytes) 16

Summary statistics:
Total messages XMIT 2734 RECV 0
Total bytes XMIT 43744
Messages per second 91.1
Bytes per second 1458
Line throughput (baud) 11665
__ Line utilization 1.1
```

DTS INTERRUPT

This command invokes the interrupt test with the pattern subtest. DTS sends interrupt messages to DTR on node DALLAS where test information will be printed. The interrupt message size is 16 bytes, and the duration of the test is 30 seconds (by default).



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